EXERCISE-INDUCED VENTRICULAR TACHYCARDIA: RISK AND PROGNOSIS.

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Exercise-induced ventricular tachycardia (EIVT) during exercise testing is considered to increase risk during testing. Moreover, EIVT has been considered to confer a poor prognosis though this has not been specifically studied. On a retrospective view of 3869 patients who had undergone routine clinical exercise testing between September 1984 and June 1989, we identified 55 patients with EIVT. Non-sustained ventricular tachycardia (VT) was defined as ventricular ectopic beats greater or equal to three consecutive beats (range 3 to 21 beats). Sustained VT was defined as VT longer than 30 seconds or requiring intervention. Mean follow-up was 26 months (range 2 to 58 months). Fifty-one patients had nonsustained VT during exercise testing and only one patient died due to congestive heart failure during the follow-up period. Four patients had sustained VT during exercise testing, and only one died of sudden death seven months after the test. EIVT was reproduced in only two patients of the 29 patients who underwent repeat testing.

In conclusion: (1) EIVT was rare in occurence with an incidence of 1.2%; (2) EIVT was not associated with complications during testing; and (3) mortality in the EIVT group (1.7%) was not significantly different from the mortality in the entire population (2.6%).

Thursday, March 22, 1990
10:30AM–12:00NOON, Room 36
Programmed Stimulation for Ventricular Arrhythmias

INTRAPATIENT VARIATION IN VENTRICULAR TACHYCARDIA CYCLE LENGTH: RELEVANCE TO ANTITACHYCARDIA DEVICE DEVELOPMENT.

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Understanding the degree of fluctuation between multiple episodes of ventricular tachycardia (VT) from the same patient is necessary to develop VT detection and termination algorithms. We analyzed 115 episodes of induced sustained monomorphic VT to determine variation in VT cycle length (CL), differences in time to stable VT, and CL range between episodes of VT from the same pt. At least 2 episodes of VT per pt were compared at baseline (n=43) or on identical antiarrhythmic therapy (n=72). RESULTS:
1) INTRAPATIENT VARIABILITY (VAR) - (the difference between the standard deviations of the mean CL's between VT episodes from the same pt): VAR between episodes of VT diminished significantly over the first 20 beats (26±25 msec vrs 12±20 msec, p<.001) then VAR remained constant out to 50 beats (11±16 msec vrs 7±15 msec, p=ns).
2) STABILITY (CL was considered stable when it varied <10 msec): The number of beats to stable VT was > 5 beats in 77% of pts, > 10 beats in 59%, and > 15 beats in 49%. Thirty-one percent of pts (12/39) had at least 1 VT episode which did not stabilize by 50 beats.
3) RANGE: The differences in stable VTCLs between episodes were > 10 msec in 69% of pts, > 30 msec in 56%, and > 70 msec in 33%. The maximum range in stable VTCL from the same pt was 180 msec.
CONCLUSIONS: 1. Intrapatient VTCL VAR is time dependent. 2. One-third of pts will have at least one episode of VT which does not stabilize. 3. Variations in VTCL must be considered in VT detection and termination algorithms.

EXERCISE BLOOD PRESSURE RESPONSE IN HYPERTROPHIC CARDIOMYOPATHY; FREQUENCY AND CLINICAL SIGNIFICANCE.

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Sudden death is common in young patients with HCM and the mechanism(s) are unclear. Abnormal exercise BP responses have been documented in HCM. To determine the frequency of exercise hypotension and its clinical significance 129 patients (aged 10-74;mean 41yrs) underwent evaluation and were followed 3-24 median 10 months. Symptom limited treadmill exercise testing was performed (x2) with measurement of maximal oxygen consumption (VO_2max) and anaerobic threshold. Systolic blood pressure (SBP) was measured by cuff during each minute of exercise and every 15 seconds for 3 minutes of recovery. The pattern of blood pressure was reproducible in 123/129. Exercise hypotension (fall in SBP >20mmHg from peak value) occured in 43(33%), abnormal recovery BP (rise SBP >10mmHg from the minimum value) occured in 23(18%), 63(49%) patients had a normal BP response. In those with exercise hypotension the magnitude of the fall was 20-110 median 70 mmHg. Univariate analysis revealed that of 12 clinical, 2D echo/Doppler, 48-hr ECG, radionuclide angiographic and VO_2max measurements only a family history of sudden death (15/43 vs 6/62;p<0.001) young age (33 12 vs 46 14 yrs;p<0.001) and left ventricular end-systolic and end-diastolic dimensions (24.4 5 vs 27.0 7; p=0.04 and 41.3 5 vs 44.6 7 ;p=0.01) were significantly associated with exercise hypotension. 3 patients with exercise hypotension, all teenagers, sustained sudden death during follow up. Exercise hypotension is frequent in HCM; abnormal hemodynamic responses in young patients may represent an important marker for those at risk of sudden death.

HOW REPRODUCIBLE ARE THE RESULTS OF ELECTROPHYSIOLOGIC TESTING DURING ANTIARRHYTHMIC DRUG THERAPY?

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Although electrophysiologic studies (EPS) are commonly used to assess antiarrhythmic drug (AAD) efficacy in pts with ventricular tachycardia(VT), the reproducibility of EPS during therapy has not been definitively established. We performed confirmation studies during AAD therapy in 100 pts with sustained VT/VF induced during initial EPS to assess the reproducibility of AAD efficacy. 75 pts were male, group mean age was 59.5 years (range 17-82). Underlying heart disease was coronary artery disease in 64 pts, 5 valvular, 2 hypertensive, 21 cardiomyopathy, 2 other, 6 unknown. EPS protocol included up to 3 premature stimuli during sinus rhythm and ventricular pacing at 2 rates. RESULTS: AAD efficacy as assessed by EPS was confirmed in 80% of pts. Sustained VT was induced at repeat EPS in 17% of pts during AAD therapy previously defined effective. 23 pts had confirmation EPS on more than one AAD, 35% failed second AAD confirmation. CONCLUSIONS: 1) EPS results during AAD therapy exhibit day to day variability. 2) Sustained VT can be induced during AAD therapy previously felt to be effective. 3) Confirmation of noninducibility during AAD therapy in pts with VT is recommended.